Claim 4. (Amended) A glass fiber mat according to claim 1 wherein said polysiloxane is a polyalkyl siloxane, a polyaryl siloxane, a polyalkylaryl siloxane or a polyether siloxane,or derivative thereof.

REMARKS

The courtesy of a Telephone Interview with Examiner Singh is hereby respectfully acknowledged. During the course of the interview the inventive features of the application were discussed and the limitation necessary to more clearly distinguish over the cited art were considered. These limitations have been inserted into claim 1 herein.

Claims 1, 2, 7 and 8 were rejected under 35 U.S.C. 102(b) on Mirous. The Examiner has indicated that Mirous discloses high tear strength glass mats having a urea-formaldehyde resin binder applied to a fibrous glass mat and useful in making roofing shingles.

Applicant respectfully traverses the Examiner's rejection of claims 1, 2, 7 and 8, as amended herein, on the cited reference. Applicant can find no disclosure, teaching or suggestion therein which would anticipate the amended claims of the present invention.

In order to further narrow the issues present herein, Applicant has amended claim 1 to recite (1) that the adhesion modifier is a polysiloxane which (2) is applied to the surface of the glass mat and is non-reactive with its surface; and (3) whose asphalt-coated hand sheets and asphalt roofing shingles containing such treated glass mats meet or exceeds Tear Test D-1922 (ASTM D-3462, July 10, 1997 Ed.). In fact, such asphalt shingles have a tear strength of about 2207 in gf which is substantially in excess of the 1700 required by the ASTM standard for commercial asphalt-roofing shingles at conventional weights and without requiring modification of urea-formaldehyde binder used therein.

While the reason for the unexpected effect is not completely understood at present, it is observed (Figs. 1 and 2) that such adhesion modifier-treated, asphalt-impregnated glass mats feature a tear region in which the fibers are pulled out, not torn or broken, which enhances its tear strength.

Considering the references, it is seen that Mirous is directed only to a process of making the glass fiber mats themselves, which require a binder to hold the mat together. Usually the binder is a urea-formaldehyde resin. Mirous, however, discovered that by adding water-insoluble anionic phosphate esters to the urea-formaldehyde resin, high tear strength mats per se could be prepared. Clearly, Mirous does not disclose, teach or suggest the polysiloxane adhesion modifier of the present invention, which is applied non-reactively to the surface of the glass mat and which promotes tear strength in an asphalt-impregnated glass mat in an unusual way so that the ASTM standard is met or exceeded. Stated another way, the present invention begins where the Mirous process of binding the glass fibers left off. Specifically, in this invention, the glass fiber mat is thereafter coated with the polysiloxane adhesion modifier, suitably from a solution or emulsion which is applied, preferably by spraying or dipping, onto the wet or dry mat before curing.

Marzocchi only describes a composition for use in treatment of glass fibers to provide a more secure bonding relationship between glass fibers and elastomeric materials in the manufacture of glass fiber-reinforced elastomeric products. This composition is a resorcinol-aldehyde resin prepared by reacting resorcinol and an aldehyde in the presence of an amino silane, silanol or polysiloxane. Accordingly, the disclosure relates to the preparation of a new resin which has an organo-silicon compound chemically bonded to the resorcinol-aldehyde matrix. Of course, such organo-silicon compounds must be reactive enough to enter chemically into such matrix. Preferred are silanes having a readily hydrolysable group. These actives are not suitable as non-reactive adhesion modifiers in this invention.

In contrast, the polysiloxane adhesion modifiers in applicants' invention are not incorporated in the resin nor are they reactive, or intended to be reactive, with any elastomeric material. Quite the contrary, the adhesion modifiers of this invention are applied to the surface of the glass mats and are non-reactive with the glass mats and the asphalt-impregnated into the mats. They demote physical adhesion between mat and asphalt so that the fibers are pulled out, not torn.

In view of the foregoing, the claims as amended are believed to be allowable over the cited art alone or in combination. Reconsideration and early allowance is respectfully solicited.

Entry of this amendment is believed to be proper because it places the application in condition for allowance or in better form for appeal.

Respectfully submitted,

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AMENDMENT TO THE CLAIMS IN MARKED-UP VERSION IN ANSWER TO EXAMINER'S FINAL REJECTION MAILED 08/13/2002.

Claim 1. (Amended Twice) A glass fiber mat for use in a roofing composite, said mat comprising, by weight, about 68% to about 90% of fibers; about 10% to about 32% by weight of an organic resin binder; and having applied to the surface of said glass mat about 0.001% to about 20% by weight of an adhesion modifier **which is non-reactive with said surface but** which induces fiber pull-out during tear of the composite and **thereby** provides improved composite tear strength **wherein asphalt-coated hand sheets and asphalt shingles thereof meet or exceeds Tear Test D-1922 (ASTM D-3462, July 10, 1997 Ed),** and wherein said adhesion modifier is **a polysiloxane.** **[**selected from the group consisting of siloxanes, glycerides, phosphate esters of fatty acids or alcohols, fatty ammonium salts, saponified oils, coconut oil, polyamines, fatty amines, fatty amine oxides, amido amines, polyamido amines, amine substituted terpenes, polyamides and mixtures of the above with glycerols or glycols.**]**

Claim 4. (Amended) A glass fiber mat according to claim **1** **[**3**]** wherein said polysiloxane is a polyalkyl siloxane, a polyaryl siloxane, a polyalkylaryl siloxane or a polyether siloxane,or derivative thereof.